MINI-MICRO SURVEY: Organizational Computing Arrives *page 42*

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DATAMATION®

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

NOVEMBER 15, 1990

Terry McGowan, president, KnowledgeWare Inc., with Application Development Workbench

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NOVEMBER 15, 1990

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

VOLUME 36
NUMBER 22

KnowledgeWare's ADW: the first OS/2 CASE tools for the pros.

COVER STORY

CASE Power For OS/2 34

BY J. WILLIAM SEMICH Undeterred by the furious frenzy of Windows-OS/2 wrestlemania, KnowledgeWare is first to launch CASE tools that run under OS/2, with its Application Development Workbench. ADW's biggest customer: IBM.

Cover photography by Chipp Jamison

SPECIAL REPORT

MINI-MICRO SURVEY

Organizational Computing Arrives 42

BY PAUL PINELLA Networks will change forever the shape of U.S. computing. With the hardware and operating systems in place for companywide communications, IS managers say the stage is set for new networking applications to drive the enterprise.

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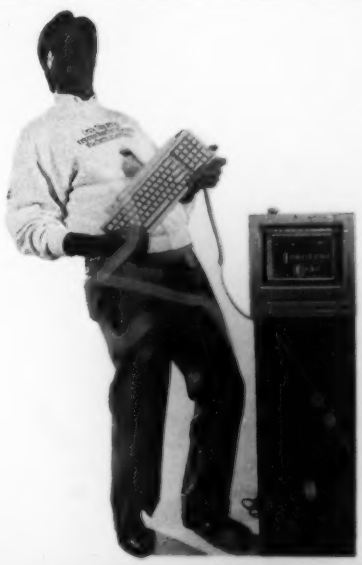
FEATURE

Apple Plays Up A Low-Cost Mac 101

BY MIKE RICCIUTI The Macintosh LC has a combination that Apple customers have long been waiting for: color and a low price tag.



Apple's Goins wants to put a Macintosh within everyone's reach.

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A Secure Future For Diskless Workstations 53

BY BOB FRANCIS Stung by data disaster stories and charged with responsibility for network security, more IS managers are seeking the sanctuary of diskless workstations. But not every user will want to go diskless anytime soon.

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OS/2's Multiuser Migration 63

BY BOB FRANCIS From the beginning, one of the brickbats most often hurled at OS/2 has been its lack of multiuser capabilities. Following the release of this customized OS/2 version, that criticism won't be true any more.

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Macs Get A VAX Connection 69

BY MARK SCHLACK The long-awaited product of the Digital/Apple joint development project, DEC LanWORKS for Macintosh, achieves a high level of integration between the Mac and VAX worlds.

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BY RALPH CARLYLE If your vanilla-flavored financial management system doesn't know a Krone from a Krona, a Riyal from a Ringgit or a Peso from a Pesata, you need this guide to picking the right international financial applications.

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Which Database For Digital's Customers? 87

BY JEFF MOAD Just try to pin Digital down. One day the company thinks it's selling only its proprietary Rdb database product; the next it's out with its database competitors trying to sell their products.

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BY DWIGHT B. DAVIS Data center managers are sizing up a myriad of automation products. Here is DATAMATION's guide through the maze of products designed to light up your life by keeping your data center's lights out.

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SPECIAL REPORT
MINI-MICRO SURVEY

Organizational Computing Arrives

Networks will change forever the shape of U.S. computing. With the hardware and operating systems in place for companywide communications, IS managers say the stage is set for new networking applications to drive the enterprise.

BY PAUL PINELLA

The much talked and written about age of network computing is finally beginning to dawn.

That networks are beginning to play a significant role in the way corporations compute at all levels is a major conclusion reached from examining this year's DATAMATION/Cowen & Co. Mini/Micro survey. Based on the answers to questions sent to over 66,000 DATAMATION subscribers last summer, the survey documents a dramatic shift toward networks driven largely by the irresistible allure of specific applications. Jim Manzi, president and chief executive of Lotus Development Corp. in Cambridge, Mass., has described this trend as "organizational computing."

The evidence for this trend is overwhelming. By next year, over 80% of respondents indicating that they have a network say they'll have peripherals-sharing and file transfer applications in place on them, up from the 60% who are using them now. Beyond 1991, 82% of users see networks delivering electronic mail throughout their companies—way up from today's 44%—and 68% expect to be using groupware applications, despite today's limited software selection.

Clearly, the shift toward organizational computing is part of the equally dramatic shift toward desktop systems that was also documented in last year's survey (see "The Desktop Dimension," November 1, 1989, p. 28). For the second year in the 14-year history of our annual survey measuring U.S. users' intentions to buy mini and microcomputers, the dollar value of minicomputer shipments is expected to decline by 8%. Meanwhile, investments in microcomputer systems—particularly workstations and laptop PCs—continue to climb. The dollar value of PC shipments is expected to grow by 8% this year, although unit shipment growth will slow to 3%. Workstation shipments should soar by a healthy 31% in dollar terms, driven largely by strong Sun Microsystems Inc.'s products and increasing interest in IBM's RS/6000 family.

Plans to meld distributed systems into sitewide or organizationwide networks are apparent among survey respondents. Already, 52% of sites have departmental networks and 30% have sitewide networks. Longer term, at some point after 1991, 60% of all users expect to have organizationwide networks in their firms.

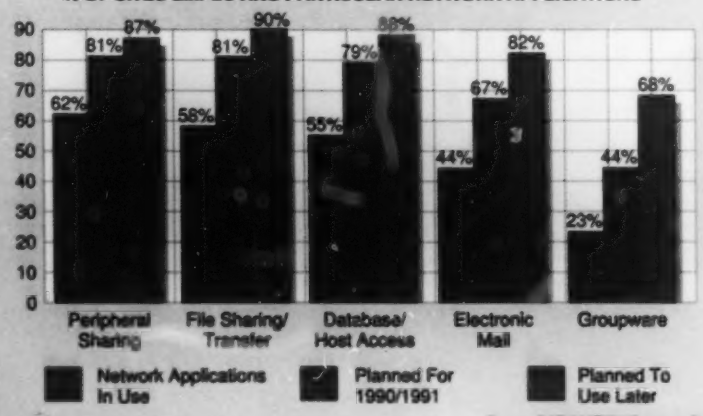
In support of the shift toward networks and organizational computing, this year's survey reveals the following trends:

- A continued growth in organizationwide networks, particularly as departmental networks become commonplace.
- An increasing reliance on UNIX and re-

Software Drives The Networking Market

Users are becoming increasingly drawn to network-capable applications such as electronic mail, host access and groupware.

% OF SITES EMPLOYING PARTICULAR NETWORK APPLICATIONS



Source: DATAMATION/Cowen & Co.

duced instruction set computing (RISC) as the software and hardware engines of choice driving organizational computing.

- Strong growth in high-end network servers from industry leaders Compaq Computer Corp., IBM and Sun.
- Big gains for software suppliers able to meet customer demands for interoperable applications across multiple platforms.

A Nation Of Networks

Many industry observers believe the shift toward organizational computing is largely a networking phenomenon. "Downsizing and open systems are enabled in large part by networks," says Chris Mines, a Cowen & Co. analyst. As networks become the glue that holds companywide computer systems together, leading vendors of PC local area networks are hoping to move upscale with their products and establish solid mini and mainframe connections. Meanwhile, leading mainframe and minicomputer

companies are moving in the opposite direction in an all-out embrace of PCs.

For example, just how well Provo, Utah-based Novell Inc. will be able to switch gears from a PC-oriented vendor to an organizational computing company is open to question, despite the company's potential success next year with NetWare 386 and its toehold in client/server technology gained through an equity investment in database supplier Gupta Technologies Inc. Because the LAN business is relatively new, there's still time for another player to grab market share. Possible contenders include Microsoft Corp., through its new army of LAN Manager 2.0 recruits, or old standbys Digital and IBM, both of which show staying power in organizationwide networks.

No matter which network operating system eventually prevails, the strength in the still-embryonic market for client/server databases lies with Oracle Corp., despite gains by Microsoft's SQL Server. Some 43% of users plan to stick with the server version of Redwood Shores, Calif.-based Oracle's database product to meet their client/server database needs in 1990/1991.

UNIX: At Home On The Midrange

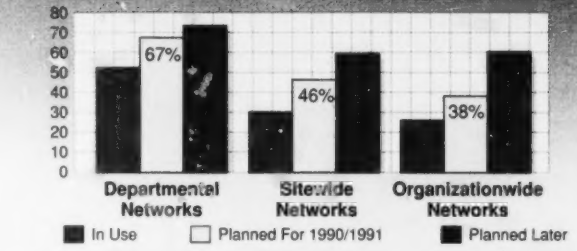
Oracle also appears strong among survey respondents as a preferred database supplier for UNIX-based minicomputers. But the company is expected to lose ground among users of Digital minicomputers: while 24.8% of Digital users say they are using Oracle today, only 19.6% are planning to buy it during 1990/1991. One possible explanation for the decline: the bundling of Digital's own Rdb product with new minicomputer sales.

As interest in organizational computing accelerates, and with it a concomitant interest in open systems, survey respondents increasingly see UNIX as the most likely operating system to capture the midrange and workstation markets. By next year, nearly half of all respondents' systems in technical settings will be running UNIX, compared with 33.8%, and nearly 24% of all commercial sites are planning to use it, compared with 14% now.

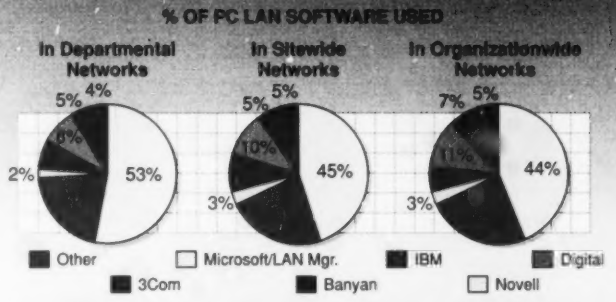
Of particular interest here is the growth rate of UNIX in the commercial sector. While proprietary operating systems still command the greatest share of commercial sites, UNIX is spreading at an 18-month compound growth rate of 40% among commercial users. Original equipment manufacturers

Networks Move To Center Stage

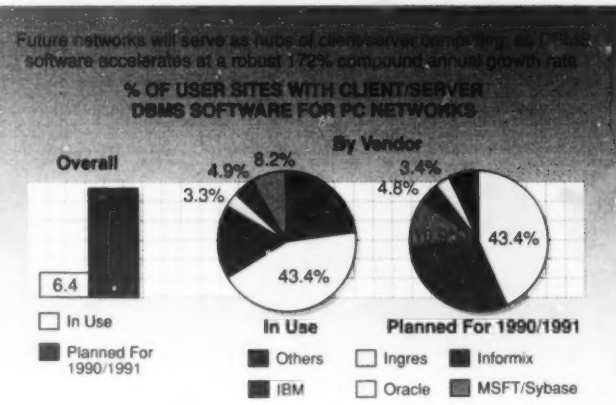
Networks will continue to evolve from departmental to organizationwide computing systems.



Novell's PC LAN software continues to dominate the departmental network business, but its market share is smaller in sitewide and organizationwide networks.



Future networks will serve as hubs of client/server computing, as DBMS software accelerates at a robust 172% compound annual growth rate.



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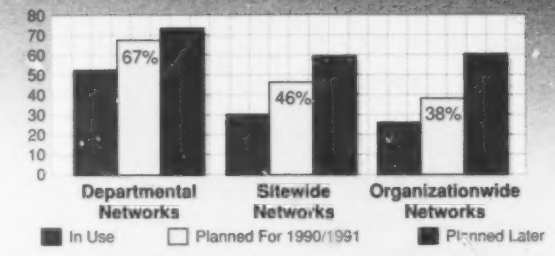

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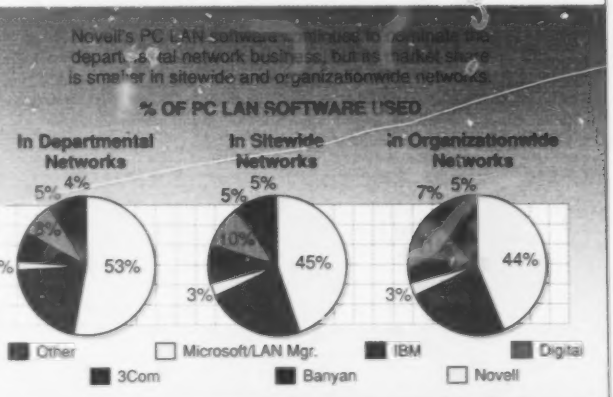

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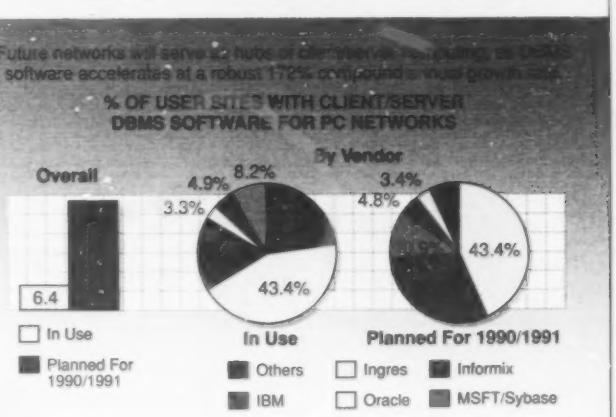
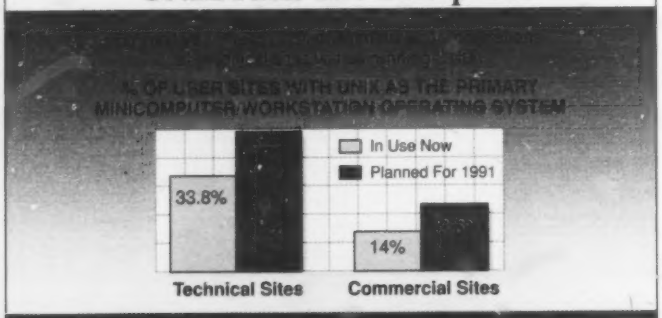
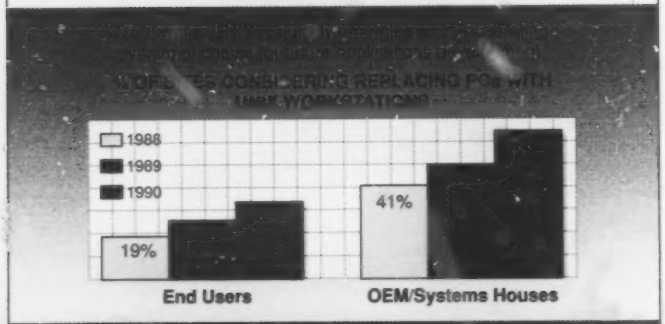
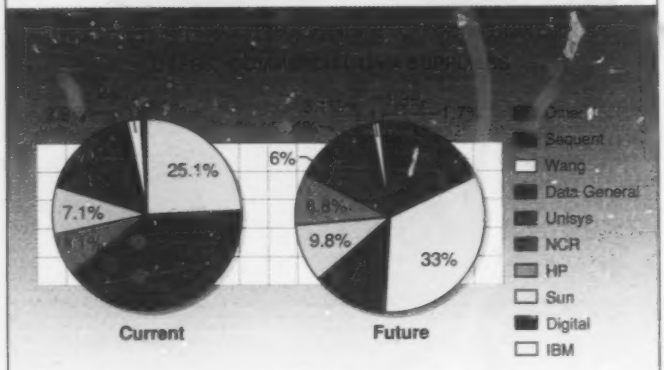


Source: DATAMATION/Cowen & Co

UNIX Fuels The Enterprise







*Note: These same sites may also have technical systems.

Source: DATAMATION/Cowen & Co.

(OEMs) and systems houses are embracing UNIX even faster. For next year, 65% of them indicated they would be UNIX resellers in the future (1991 and beyond).

One explanation for the surge in popularity of this 21-year-old operating system is the equally stunning shift toward multiprocessor midrange systems. With announcements of RISC- and complex instruction set computing (CISC)-based products becoming commonplace, UNIX has emerged as the only operating system flexible enough to port to practically any platform, including a new generation of transaction-processing systems from NCR Corp., Sequent Computer Systems Inc., Stratus Computer Inc. and Tandem Computers Inc. "We believed in UNIX five years ago," says Tandem's president, Jim Treybig, whose company announced a UNIX-based multiprocessor system earlier this year. "The mainframe of the future will be RISC technology."

Although UNIX enjoys a reputation for openness, users are becoming increasingly closed-minded about whom they choose as their UNIX supplier. The big four—IBM, Digital, Sun and Hewlett-Packard Co.—will capture close to 65% of the commercial systems market in future years, leaving Data General Corp., NCR, Sequent, Unisys Corp., Wang Laboratories Inc. and smaller competitors to fight over the remaining market. But even Digital's spot in the top tier of UNIX suppliers is by no means assured. Among survey respondents in the UNIX commercial arena, 15.1% cite Digital as their current UNIX systems supplier, but this number drops to 12.9% when respondents were asked about their future plans.

Although UNIX is likely to remain popular on multiuser midrange systems for years to come, even greater growth is coming from workstations running UNIX. This year and next, users estimate that 45% of their new application development projects will be workstation- or PC-based. Longer term, more than half of all organizationwide applications will be established on desktop systems. As users begin to evaluate powerful workstation offerings from the UNIX industry leaders—IBM customers in particular seem poised to acquire RS/6000s in large numbers—this trend is likely to accelerate. Based on the survey findings, the IBM RS/6000 alone will account for sales in excess of $1 billion next year.

The Prognosis For PCs

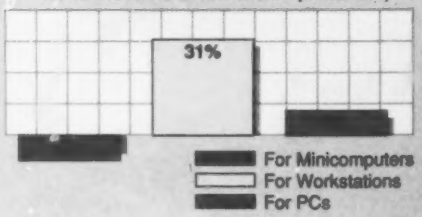
Perhaps no single machine defines organizational computing as much as the personal computer. Office PCs have quickly made the transition from the 64-kilobyte CP/M machines of the early 1980s to today's orders-of-magnitude more powerful desktop, and even laptop, systems with network connections.

The desktop industry is ruled by Intel microprocessor-based machines that are growing more powerful. Next year, users say that roughly half of all purchases will be for 80386 or 80386SX-based PCs, which can run more sophisticated operating environments such as Microsoft Windows or at some point OS/2. By June of 1991, 29% of all 80386 pur-

The Desktop Drive Toward Organizational Computing

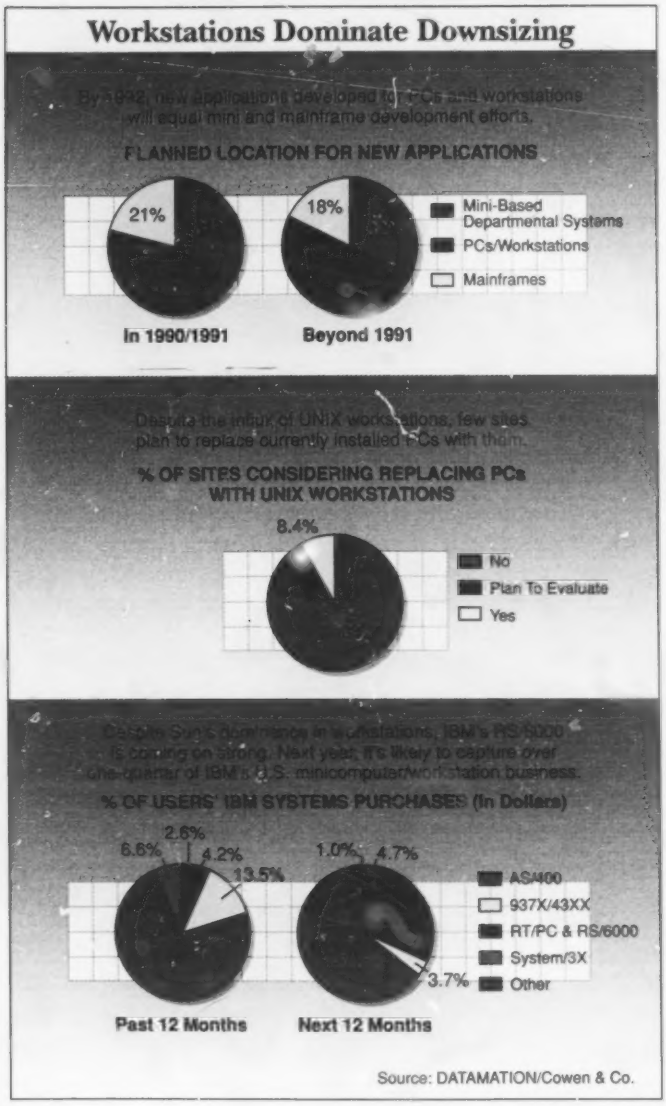
In terms of growth, minicomputer shipments will shrink for the second year in a row as PCs moderate and workstations soar.

PROJECTED % GROWTH OF U.S. COMPUTER SHIPMENTS FOR THE 12 MONTHS ENDING 6/91 (In Dollars)



Source: DATAMATION/Cowen & Co.

Workstations Dominate Downsizing



Source: DATAMATION/Cowen & Co.

chases will be awarded to IBM (down from the previous 12 month's 32%), 18% to Compaq (down from 20%) and 6% to Everex (down from 8%). The only significant non-Intel based system—the Apple Macintosh—will capture 8% of buys among sites planning to purchase PCs next year, a figure essentially unchanged from 1989.

But, with a 35% market share, the biggest winner in the 386 category belongs to "other," or the PC clones, which advanced 6% from the prior 12 month figure. This trend apparently reflects management's rising commodity view of the PC market and sensitivity toward price, which in another part of the survey users ranked as more important than product reputation, compatibility or supplier viability. "Price continues to become an increasingly important criterion," says Cowen & Co. analyst Michele Preston.

In yet another bit of evidence indicating a growing disinterest in PC brand-name purchasing, only half of users at all surveyed sites feel the need to standardize future PC purchases around any one supplier.

As the need for more powerful PCs becomes more apparent, the era of the hand-me-down machine is drawing to a close, and a replacement cycle is beginning. This year, only about 59% of users say that earlier-generation machines will be used elsewhere in the organization. Last year, nearly 74% said they would keep using the old machines. When PCs become obsolete, more of them are being retired, sold, traded in or simply given away to make way for their more capable replacements.

Year Of The Laptop

Although the growth in PC shipments is actually decelerating (last year's growth projection was 11% compared with this year's 8%), survey respondents' plans to buy laptops reveal a market segment with much potential. According to the survey, laptop shipments will swell by more than 60% over 1990 levels. Some of the rise can be attributed to what heretofore has been a small installed base. But, in addition, IS managers are telegraphing suppliers that their products have finally met requirements for usefulness, compatibility, price and performance.

Further laptop improvements expected in 1991—for example, Intel's refinement of the 80386SX chip and Japan's perfection of high-quality, flat panel displays—are expected to push this market to even greater heights. Users have chosen Compaq to be their No. 1 laptop supplier for the 12 months ending in June 1991 (27% of indicated unit purchases, up from the prior 12 months' 21%), followed by Toshiba Corp. (22%, from 29.3%) and Zenith Data Systems Corp. (16%, down from 28%).

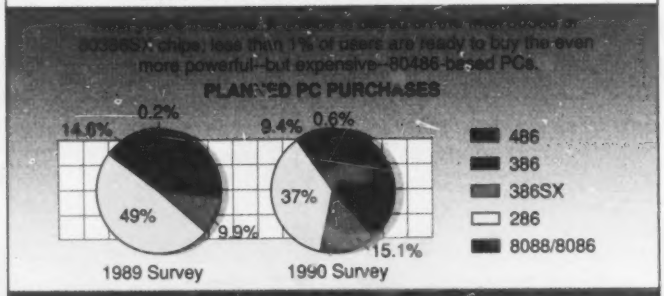
Organizational Software

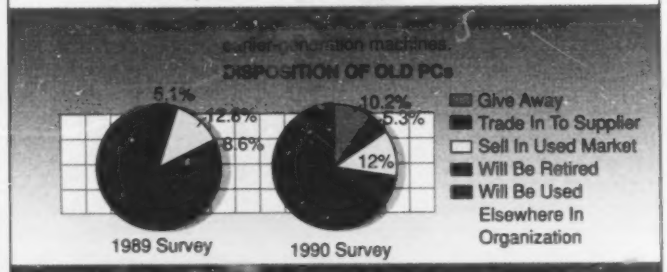
No pioneering applications emerge in the survey to shake the industry in the same way that Aldus Corp.'s PageMaker desktop publishing package or Lotus Development Corp.'s 1-2-3 spreadsheet software once did. The one software star that does stand out in the 1990 survey—is Microsoft Windows 3.0. IBM PC and compatible users estimate that 23% of their future (1991 and beyond) PC operating system use will be Windows, which should drive growth for other application packages.

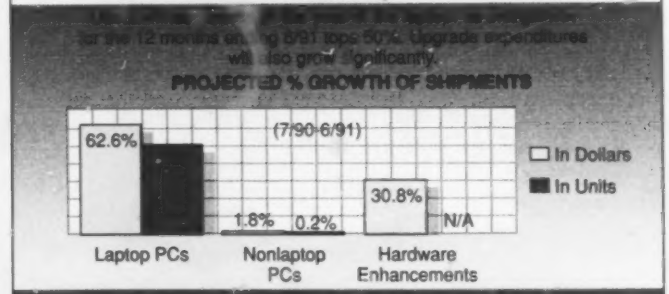
Still, a few notable, albeit subtle, software shifts are apparent. In the spreadsheet department, users say that industry leader Lotus, now with 75% of the market, will eventually hand over about 13% of its share to Borland International Inc.'s Quattro Pro and Microsoft's Excel. A similar transition is under way in databases; while Ashton-Tate Corp.'s dBASE product currently commands 52% of the database market, managers expect that situation to change as Borland snaps up 15% with its Paradox and Reflex products.

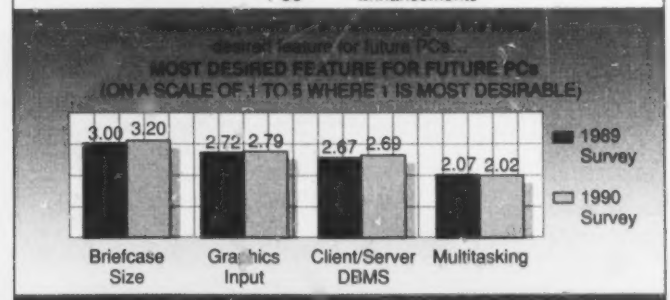
Rather than creating dazzling new applications, leading developers are directing their energies toward porting their applications to a variety of platforms. Following the premise that users want organizational applications that look and feel the same

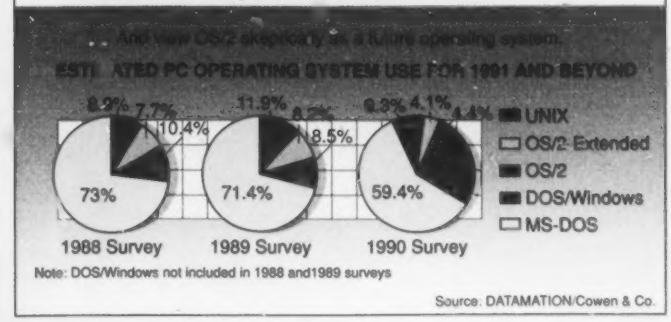
The Shift Toward Power PCs











Note: DOS/Windows not included in 1988 and1989 surveys

Source: DATAMATION/Cowen & Co.

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across platforms—and can share data easily between them—developers such as Informix Software Inc., Aldus Corp., Lotus, Microsoft, Symantec Corp. and WordPerfect Corp. are beginning to introduce product families that do indeed work much the same on IBM PC compatibles, Apple Macintoshes and even a few UNIX machines. "A cross-platform strategy is very important," stresses Mort Rosenthal, chairman and chief executive officer of Corporate Software Inc., a Canton, Mass.-based software and services firm catering to large companies.

Microsoft Windows 3.0 is the most obvious beneficiary of a cross-platform strategy. By delivering the closest interface yet to a Macintosh environment on PCs, Windows has already prompted a number of developers to introduce both Macintosh and PC versions of their products. Windows also offers multitasking on 80386-based PCs, a feature that surveyed users rank ahead of client/server databases, graphics input or briefcase-sized computing in importance for longer term future PC usage. Users forecast that Windows will be running on close to 23% of all business PCs next year.

As Windows begins to give PC users a transition into a multitasking, graphical environment, and as workstations begin to move down into productivity markets once dominated by PCs, the lines between the two will continue to blur. "The separate world of PCs and workstations is not so separate anymore," says Jim Cannavino, president of IBM's entry systems division.

Nevertheless, only 8% of users anticipate replacing their existing PCs with workstations, and another 14% plan to evaluate replacement. The majority still see the two types of desktop systems living and communicating side by side—in true organizational computing style—for perhaps years to come. ▭

Survey results are available to the public and include over 200 pages of industry-related charts and graphs. For more information, contact Nancy Finn, Business Research Group, 275 Washington St., Newton, MA 02158. Phone: (617)-964-6204, fax: (617)-558-4402.

Survey Methods

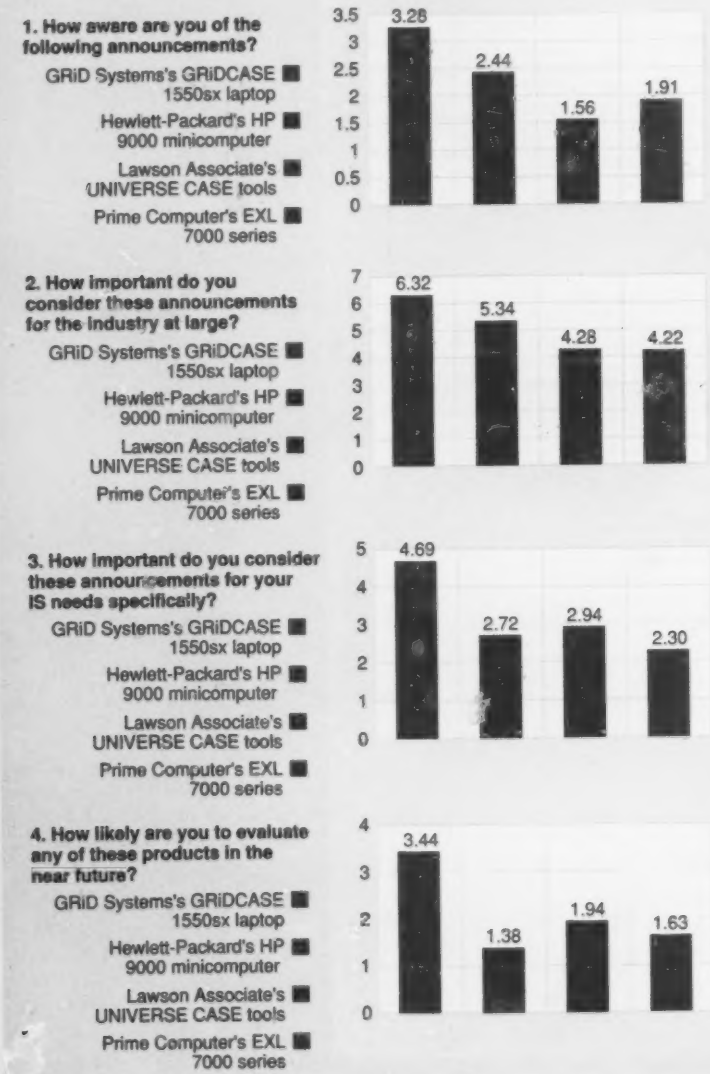
The 15th Annual DATAMATION/Cowen & Co. Mini/Micro survey is based on 4,062 reader survey questionnaires returned following a mass mailing last summer to more than 66,000 DATAMATION subscribers. The survey is administered by Cowen & Co.-Institutional Services, a financial securities firm whose Boston and New York-based research team specializes in high-technology and health care-related companies. This year's sample combines user responses from a wide cross-section of industries, including manufacturing, business services and government. Although the survey does not constitute a scientific sampling of the U.S. user community, the results do highlight general directions IS managers are moving their organizations in the year ahead.

A Grid Lock On The Top Spot

DATAMATION'S USER PRODUCT REVIEW

Pick Of The Pack

The DATAMATION Review Panel was asked the following four questions for each product. Panel members were asked to respond on a scale of 1 to 10, with 1 meaning ""not very" and 10 meaning ""extremely." The results represent the average of all responses for each question.



The Lineup

GRiD Systems Corp. of Fremont, Calif., introduced the GRiDCASE 1550sx, a laptop computer with a built-in mouse-compatible input device for use with graphical software. The 12-pound laptop comes standard with a 60-megabyte hard disk, a 20-megahertz 80386sx microprocessor, an input device and 2MB of internal memory. It is priced at $6,295.

Circle No. 590

The HP 9000 model 860S minicomputer was introduced by Palo Alto-based **Hewlett-Packard Co.** The system is designed for on-line transaction-processing applications in accounting, inventory management, sales and order processing. The system is priced at $291,000.

Circle No. 591

Minneapolis-based **Lawson Associates Inc.** introduced two new computer-aided software engineering (CASE) tools in its UNIVERSE line of software products. UNIVERSE/CASE and UNIVERSE/Report Writer work with Lawson's PINSTRIPE and PINPOINT software packages. Prices for the software start at $12,000.

Circle No. 592

Prime Computer Inc. introduced the PRIME EXL 7000 series systems based on reduced instruction set computing technology (RISC). The Natick, Mass.-based company offers four models in the series, ranging from the PRIME EXL 7330, at $18,000—a deskside server rated at 25 million instructions per second (MIPS)—to the EXL 7680, a 68 MIPS multiuser system, priced at more than $150,000.

Circle No. 593

DATAMATION'S User Product Review is conducted twice a month by a panel of the magazine's readers. Panel members base their judgments on published information about each of the products under review. Their responses are sent to DATAMATION by fax. If you wish to join DATAMATION's User Product Review Panel, call Mike Ricciuti, New Products, at (617)-558-4308; write to him at 275 Washington St., Newton, MA 02158; or fax him at (617)-558-4506.

MARKET INSIGHTS

AN ANALYSIS OF ECONOMIC TRENDS

Computer Industry Hangs Tough

BY MADELINE FRANCHI
Cahners Economics

The current anemic pace of economic growth stems in part from the business community's uncertainty about which direction the manufacturing sector will take in the next few quarters. With profits depressed and interest rates still relatively high, some capital-spending plans have been shelved. This pullback in investment spending has hit some original equipment manufacturers (OEMs) hard, while others have just slowed down.

The computer industry is exhibiting the strains of the business cycle downturn and the uncertain future. Output from the nation's computer and office equipment manufacturers was 1.5% lower in July of this year than it was in June (according to seasonally adjusted figures). Still, production was 6.5% higher than it had been in July of the previous year.

Clearly, the industry is adjusting to a new set of rules, with new players and different game boards.

One new rule: keep inventories under tight control. The current economic slowdown could have been more jarring if the industry had over built inventory during 1988 and 1989. Instead, inventory-to-shipment ratios remained fairly stable and certainly well below the highs of 1985.

Another rule: Take advantage of opportunities in foreign markets. Last year, U.S. computer hardware manufacturers received 40 to 50% of their revenues, on average, from foreign sales.

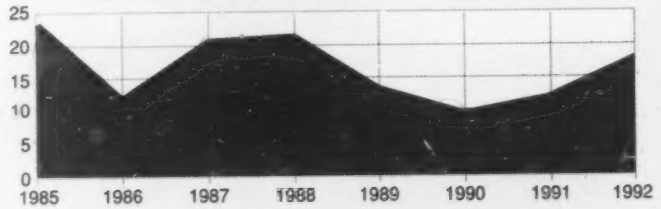
Although the economy looks a bit bleak now, new order activity is picking up. Cahners Economics predicts that the computer industry will begin pushing up production growth a little more in response to the rekindling of domestic investment. Cahners Economics forecasts output to expand 11.6% in 1991 and 17.5% in 1992.

For more information on Cahners Economics's forecasting services, contact Dan Buchanan at (617)-630-2105, by fax at (617)-630-2100 or write to him at Cahners Economics, 275 Washington Street, Newton, MA 02158.

Computer Production Growth Slows; Inventories Stable

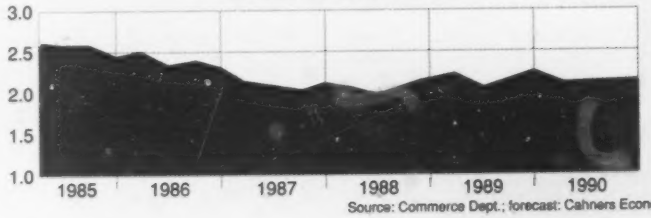
The growth rate in the production of computers is expected to drop to 9.5% this year, but rise to 11.6% next year.

ANNUAL % GROWTH IN COMPUTER PRODUCTION



Computer inventories are projected to stabilize in the third and fourth quarters.

COMPUTER AND OFFICE EQUIPMENT: INVENTORY-TO-SHIPMENTS RATIO



Source: Commerce Dept.; forecast: Cahners Economics

	Actual		Forecast (Annual % growth)		
	Q1/90	Q2/90	1990	1991	1992
Gross National Product	1.7	1.2	1.4	2.3	2.2
Business Investment In Equipment	5.7	-6.2	1.4	4.6	3.3
Government Spending	2.9	6.2	2.0	1.3	0.5
Consumer Spending	1.1	-0.2	1.0	2.0	2.1
Exports	8.3	-2.8	6.0	3.3	4.7
Imports	1.9	3.2	3.5	2.2	2.9

All calculations are % growth in 1982 dollars; quarterly figures are seasonally adjusted annual rates.

	July 1990	June 1990	% Change 6/90-7/90	June 1989	% Change 1989/1990
Manufacturing Production (1)					
Process Industries Total	109.1	108.5	0.6	108.1	0.9
Chemicals	110.4	110.0	0.4	109.7	0.6
Petroleum	109.6	107.8	1.7	108.2	1.3
OEM Total	114.2	114.9	-0.6	111.9	2.1
Computers & Peripherals	146.0	148.2	-1.5	137.1	6.5
Communication Equipment	110.9	110.8	0.1	106.0	4.6
Transportation Equipment	108.8	110.9	-1.9	106.6	2.1
Services Employment (2)					
Finance, Insurance, Real Estate	6.937	6.915	0.3	6.817	1.8
Health Care	8.174	8.129	0.6	7.598	7.6
Computer & Data Processing	0.804	0.801	0.4	0.754	6.6
Transportation/Utilities	5.842	5.881	-0.7	5.675	2.9
Retail Trade	19.946	19.981	-0.2	19.673	1.4
Wholesale Trade	6.417	6.420	0.0	6.315	1.6
Government	17.478	18.624	-6.2	16.844	3.8

(1) Index 1978=100, seasonally adjusted
(2) Millions of persons, not seasonally adjusted

Source: Commerce Dept.; forecast: Cahners Economics

MARKET INSIGHTS

A SURVEY OF TECHNOLOGY TRENDS

It's Still Early In The Game For UNIX

BY WARREN CHILDS
Business Research Group

Despite the push on several fronts, UNIX has yet to become a significant operating system in the commercial market.

A survey of the 500-member DATAMATION High-Technology Panel shows that 27% of the 276 respondents are currently using UNIX-based systems for some nontechnical applications. Of the 73% who do not currently use UNIX for nontechnical applications, 11% plan to do so within the next 12 months.

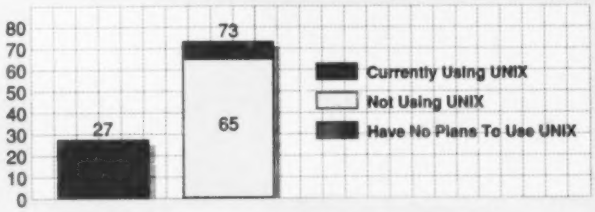
Part of the push for UNIX is coming from workstation vendors whose UNIX-based systems are well established in the technical/engineering market. These vendors are now looking to the commercial market to expand sales. In addition, many of these vendors are pushing UNIX-based open systems for office automation applications. But obstacles such as the lack of a single UNIX standard and an entrenched base of DOS systems and application software have prevented UNIX from gaining a strong foothold in the commercial market.

Meanwhile, two factions are currently competing to develop an industry standard for UNIX. These are the Open Software Foundation (OSF) and UNIX International Inc. The DATAMATION High-Technology Panel reveals that, by almost a two to one margin, users prefer the OSF version over UNIX International's as their organizations' UNIX standard.

How The UNIX Commercial World Shapes Up

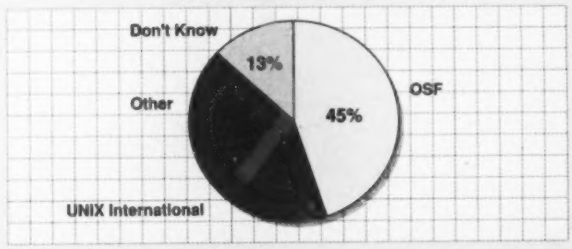
Many commercial users are still cool to UNIX...

COMMERCIAL UNIX USE



But those warming up side with OSF

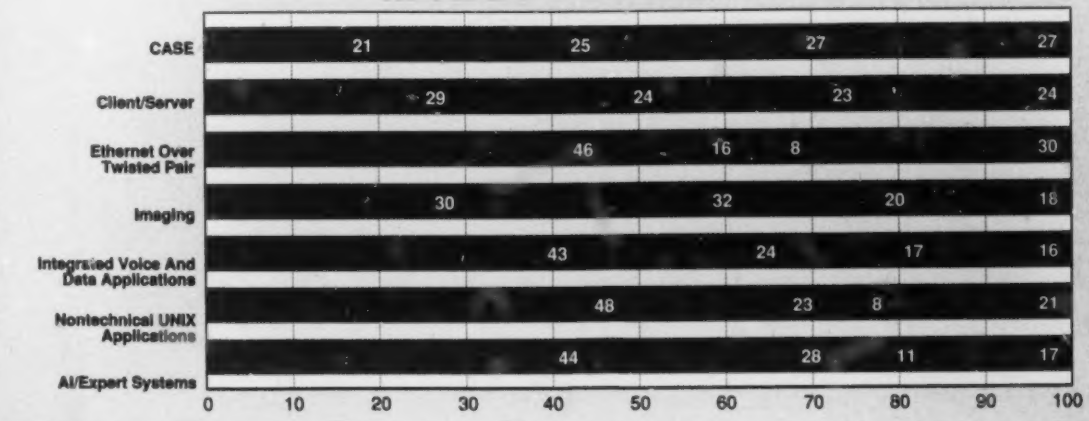
EXPECTED UNIX STANDARD



DATAMATION's Technology Implementation Index

DATAMATION each month surveys a select group of its readers–the DATAMATION High Technology Panel–to investigate the implementation of new technologies by key user organizations.

USERS' LEVEL OF IMPLEMENTATION



Source: Business Research Group

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